

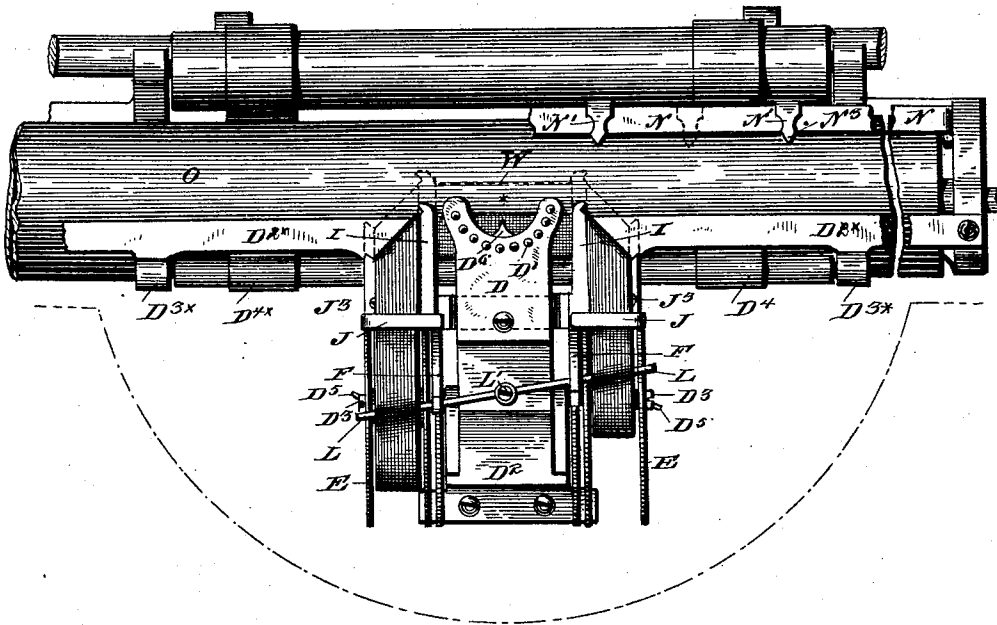
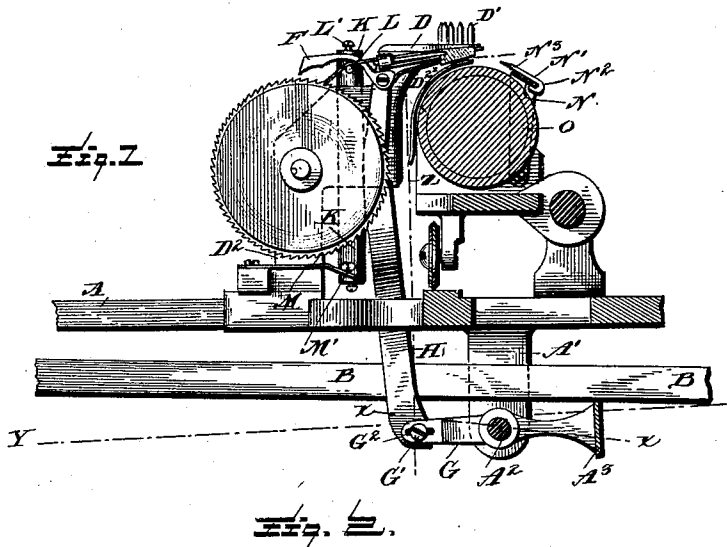
(No Model.)

2 Sheets—Sheet 1.

C. SPIRO.
TYPE WRITING MACHINE.

No. 475,623.

Patented May 24, 1892.



Witnesses

L. C. Hills.
Hutherland.

By

Inventor
Charles Spiro.
E B Stocking
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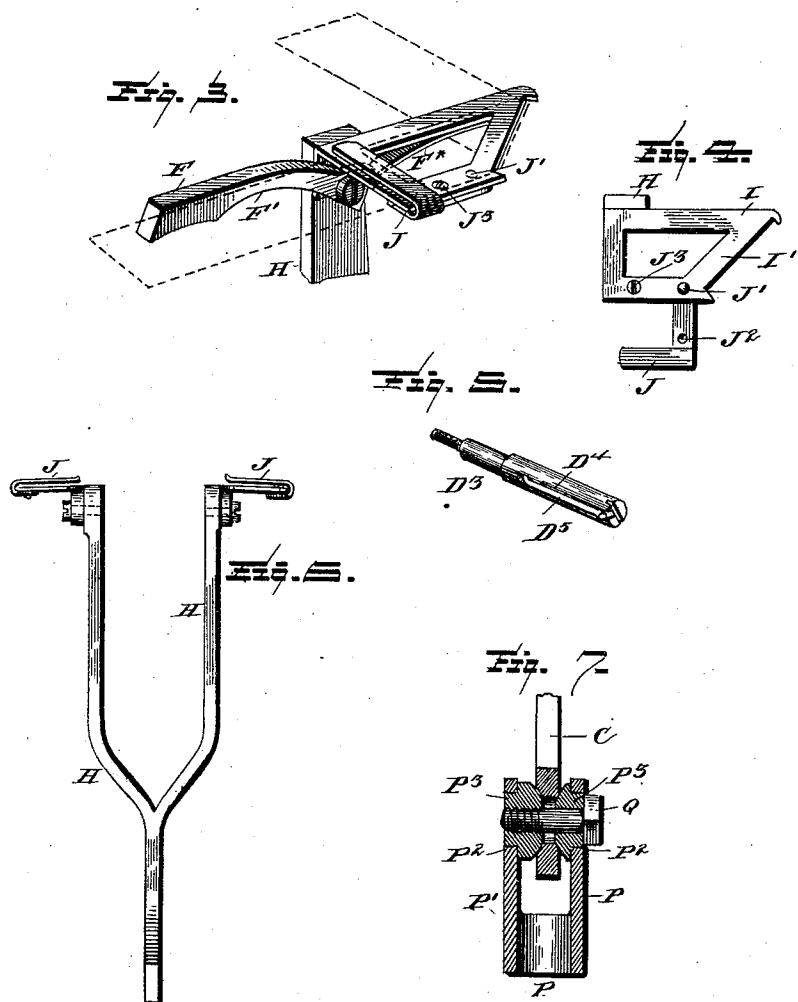
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2 Sheets—Sheet 2.

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UNITED STATES PATENT OFFICE.

CHARLES SPIRO, OF NEW YORK, N. Y.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 475,623, dated May 24, 1892.

Application filed August 5, 1889. Serial No. 319,736. (No model.)

To all whom it may concern.

Be it known that I, CHARLES SPIRO, a citizen of the United States, residing at New York, in the county of New York, State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention has relation to type-writers, and particularly to the inking mechanism, the manner of pivoting the type-bars, an automatic ribbon-feed shaft, and other devices hereinafter specified.

15 The objects and advantages of the invention will be hereinafter described, and the novel features thereof will be particularly pointed out in the claims.

Referring to the drawings, Figure 1 is a vertical section of the base, universal bail, platen, and adjacent parts with one ink-ribbon spool and other portions shown in side elevation. Fig. 2 is a plan of the principal portions of a type-writer involved in my invention. Fig. 3 is a detail in perspective of a portion of the ink-ribbon carrier, showing one spool-operating pawl. Fig. 4 is a plan of the ink-ribbon guide and its tension-bar open. Fig. 5 is a perspective of the ribbon-spool spindle and its spool-retaining latch. Fig. 6 is a front elevation of the ribbon-carrier; and Fig. 7 is a vertical transverse section of a type-bar bracket and its bearings, a portion of a type-bar being mounted therein.

35 Like letters refer to like parts in all the figures.

This invention is intended, primarily, for application to a bar type-writer—that is, one in which the printing-surfaces consist of types mounted in pivoted type-bars which are suitably connected with a series of key-levers, there being a key for each type. The invention, however, is applicable to other forms of type-writers and is not limited in this regard.

45 A represents the base of the machine from which depend hangers A' to receive the rock-shaft A², which carries the universal bail A³ that extends under the series of key-levers B, which are connected in any usual manner with type-bars C, arranged in any suitable

manner, so as to bring each type to the printing-point, Fig. 2. A locking-plate D, having pins D', is mounted on the standard D², arranged upon the base A. The portions thus far mentioned are more fully described in my patent, No. 435,775, dated September 2, 1890.

From the standard D² there project spindles D³ for the ribbon-spools E. Each spool is provided with a ratchet E', adapted to be operated in a manner hereinafter described by a pawl F. Referring to Fig. 5, the spindle D³ is screw-threaded or otherwise seated in the standard, and along its body portion is grooved, as at D⁴, and in the groove is arranged a wire or other spring D⁵. In placing a spool upon the spindle the bore of the spool is first made to pass over the end of the spring D⁵ and then over and along the body of the spindle. The spring will give sufficient obstruction to prevent accidental removal of the spool, but at the same time will permit of its ready removal without directly controlling the spring, thus contributing greatly to convenience. The outer end of the spindle may be slotted to receive a screw-driver or other instrument for inserting the spindle into the standard. An indicator D⁶ is formed on or attached to the bar-lock plate opposite and in front of the printing-point.

From the bail-shaft there extends a rock-arm G, which is connected with the ribbon-carrier H by means of a screw G', passing through a slot G² and thence into the carrier, so that the carrier may be arranged nearer to or farther from the center of the rock-shaft and otherwise disposed, so as to present different portions transversely of the ribbon to be acted upon by the type.

Although I do not limit my invention to any particular form of a movable, vibratory, or reciprocatory ink-ribbon carrier, in the present instance I have shown it as consisting of a U-shaped frame, (see Fig. 6,) on each arm of which is arranged a ribbon-guide I, the front bar I' of which is disposed at such an angle as to turn a ribbon when passing over the same in its course and at a right angle. (See Figs. 3 and 4.) The said bar, therefore, may be termed a "turning-bar," there being a guide I on each arm of the carrier. The

ribbon is conducted over one spool E to the carrier around the turning-bar on one arm to the turning-bar of the opposite arm and back to the other spool. Each arm H carries a pawl F to wind the ribbon on the spool with which the pawl co-operates. Now by providing devices for throwing one of the pawls F out of and the other into mesh with its adjacent ratchet the ribbon-feed is automatically reversed, so that when the end of the ribbon on one spool is reached the direction of the ribbon-feed, which is intermittent or step-by-step, is changed, so that no manipulation of the ribbon is required after it is once placed in the machine until it is worn out. In this construction, as before stated, it is desirable to cause one of the pawls F to mesh with its ratchet when the other of the pawls F is put out of mesh with its ratchet. It will be noted that the formation of the pawls renders their free ends comparatively heavy, so that while one is lifted from the ratchet by the wire L, as hereinafter described, the other will, by reason of the weight of its free end, fall by gravity into mesh with its ratchet. Ordinarily a gravity-pawl will mesh with the ratchet of the ribbon-spool with sufficient accuracy to cause a practically satisfactory feed of the ribbon, because it would not be a fatal objection if the ribbon were not moved along after each and every impression of a type, for it is well known that ink-ribbons will give a large number of satisfactory impressions without changing its position with reference to the printing-point; but if it be desired to insure a positive and absolutely regular intermittent feed of the ribbon after each impression then a spring, as F^x, Fig. 3, may be connected with the pawl, as shown, or in any other suitable manner for the said purpose.

It is advisable and preferable to maintain a constant tension in the ribbon at points between the two turning-bars. For this purpose I provide a tension-bar J, which is pivoted at J' and provided with a countersink J² to receive the end of an adjusting-screw J³. In placing a ribbon upon the carrier the tension-bar is swung upon its pivot, as clearly shown in Fig. 4, out of the way, and is afterward moved over the ribbon (see Fig. 3) when its pressure upon the ribbon is regulated by the screw J³. There being a tension-bar on each arm of the carrier it is apparent that the tension of the ribbon is constant and perfectly subject to control throughout all portions thereof which are adjacent to the printing-point. The devices employed in this instance for automatically reversing the ribbon-feed comprise a rod K, passing through the standard D² and projecting above and below the same. In the upper end a wire L or other similar device is passed above the standard and is retained therein by a screw L'. The ribbon at the point between the tension-bar J and the spool is guided over the wire L on

each side of the rod K, so that when the ribbon is wound almost wholly upon one spool, and therefore nearly wholly unwound from the opposite spool, the tension in the ribbon between the tension-bar and the empty or nearly empty spool is increased so that the wire L is drawn toward the tension-bar. These movements of the two parts or free ends of the wire L serve the purpose of throwing out of mesh one of the pawls F and putting into mesh the opposite pawl F with their adjacent ratchets on the ribbon-spool, so that each intermittently becomes the winding-up spool of the pair. A spring-detent M is adapted to take into the lower teeth of the spool-ratchet and is thrown into and out of mesh by a wire M', secured to and projecting from the opposite sides of the rod K in a similar manner to the wire L. Each of the pawls F is cut away, as at F', on its under side, so as to be operative notwithstanding the presence of the wire L beneath the cut-away portion. When said wire is shifted, as above described, it comes into contact with the thicker portion of the pawl near its free end and raises the same out of mesh with its ratchet. The cut-away portion permits of an oscillation of the ribbon-carrier, and therefore of a reciprocation of the pawl F over one or more teeth of the ratchet E' for the purpose of rotating the ribbon-spool.

Referring to Fig. 1, the position of the parts being shown in full lines at rest, whenever a key-lever D is depressed the axis or plane of the universal bail and the rock-arm G is changed to occupy the position indicated by dotted line X, while that of the key-lever is represented by the dotted line Y. In this movement of these parts the carrier is thrown toward the platen into the position indicated by the dotted line Z. This brings the portion of the ink-ribbon which is between the two turning-bars to the position indicated in Fig. 2 by the dotted line W, Fig. 2—that is, over the printing-point. By changing the adjustment of the lower end of the carrier—that is, its position of attachment to the rock-arm G—the distance beyond the printing-point which the carrier and the leading edge of the ribbon travels may be varied, so as to cause a type to come into contact with the ribbon at different points in its width. This feature of adjustment, although secondary, is quite important, as it permits of a longer use of a ribbon than would be the case if it were omitted. The ribbon-carrier naturally counterbalances the universal bail, so that it requires but very little extra pressure to operate the same and it acquires comparatively very slight momentum, and the consequence is that it may be very readily reciprocated and does not affect or result in a reduction of the speed at which the machine may be operated.

N represents the paper-guide, which is a bail pivoted to the carriage and serves to direct the upper portion of the paper upon the

platen O. I have devised and applied to the guide indicators N', of such construction and manner of application as will permit of their being arranged at any desired point on the guide. One or more of the indicators may be used, so that when printing columns an indicator will point out the starting-point for each column, and this without referring to the portions of the page already printed or to any scales, as the indicators are constantly adjacent to the printing-point and line of printing. The indicators N' consist of any suitable material—such as, for example, sheet metal—bent at one end, as at N², to embrace one edge of the guide and pointed at the other end N³, and, if desired, though not essential, projected beyond the edge of the guide. Other well-known constructions may be adapted to connect the indicator or indicators movably to the guide, and it may be to any part occupying substantially the same position as the guide N with relation to the platen and the printing-point thereof.

Experience has shown that the weakest part or the part or parts most liable to deterioration by use and the part giving to a type-writing machine its term of practical satisfactory work is the joint of the type-bar. Various constructions have been employed in the bar, its trunnions or pivots, and the bearings for the same, arranged in a type-bracket or a type-bar supporting part of the machine. The necessarily limited dimensions of the parts involved on account of the number of bars required necessitates lightness in structure at the very point of the machine which has to do the most rapid, accurate, and continuous labor. It therefore is a material advantage to provide a pivoted construction for the type-bar which shall be not only strong, serviceable, and accurate, but at the same time compact and accessible for adjustment.

I accomplish the above-indicated objects by the construction now to be described.

Referring to Fig. 7, P represents a type-bar bracket, which may be of any usual construction, *per se*. In this instance it consists of a U-shaped plate having vertical arms P', perforated, as at P², for the reception of bushings B³. If preferred, the bushings may be made integral with the bracket; but when it is desired to construct the bushings of any harder material then it is preferable to make the bushing separate, seating it in the perforation either by screw-threading or upsetting or in any other well-known manner. The type-bar C is perforated and the edges of its perforations adapted to the contour of the bushing, and finally a bolt or screw I is passed through the bushings and the type-bar. Now, to give the longest possible extent of threaded connection of the bolt with the bushing I make the bushing which receives the threaded end of the bolt thicker than the opposite bushing. By this construction and by reason of the smallness of dimensions of

the parts involved I obviate the stripping of the minute threads of the bolt in the act of adjusting the bearings of the bracket and bar to each other. In this instance the edges of the perforations of the type-bar are concave to adapt themselves to the convex bearing of the bushing. These parts, however, may when stiff or heavy type-bars are employed be constructed more in the nature of a conical bearing, the edges of the hole in the type-bar being simply reamed to produce a conical surface which is straight transversely or in cross-section.

I have designated the ink-ribbon carrier herein shown and described as a "movable" ink-ribbon carrier, and I desire to be understood as meaning a carrier which is movable, whether the ink-ribbon which it carries has a step-by-step movement or not.

D^{2x} is the shield which runs across the entire carriage and is fastened thereto on the risers D^{3x}. It extends as far forward as the front edge of the ribbon and curves backward to conform to the contour of the platen with which it is nearly in contact. This shield performs an important function, as it saves the paper from being soiled, and at the same time also serves as a guide for the paper after it projects above the feed-bands D^{4x}.

What I claim is—

1. In a type-writer, an ink-ribbon carrier connected with an operative part of the type-writer, to be reciprocated in a plane extending from the platen to the ribbon-spools and arranged to pass into and out of the path of the type and over and adjacent to the printing-point of the machine, and means for conducting the unused portions of the ink-ribbon in directions at right angles to the used portions, whereby a maximum of printed matter on the platen is constantly in view, as set forth.

2. A movable ink-ribbon carrier for type-writers, having provisions for holding a portion of the ribbon parallel with the platen and portions at right angles thereto, and connections whereby the carrier is adapted to be reciprocated in a horizontal plane to move the parallel portion to and from the platen in lines parallel thereto, as set forth.

3. A pivoted ink-ribbon carrier directly and adjustably connected with the bail and moving between the platen and ribbon-spools, as set forth.

4. A movable ink-ribbon carrier directly connected with the bail and carrying the ribbon-spool ratchet-pawls, as set forth.

5. A movable ink-ribbon carrier adjustably connected with a bail, whereby different portions transversely of the ribbon are presented at the printing-point, substantially as specified.

6. A movable ink-ribbon carrier, in combination with a bail and connected directly thereto to the side of the pivot opposite the key-engaging portion of the bail, as set forth.

7. A pivoted ink-ribbon carrier, combined with a bail and connected thereto to the side of the pivot opposite the key-engaging portion of the bail, as set forth.
- 5 8. An ink-ribbon carrier provided with diagonally-disposed turning-bars and pawls, substantially as specified.
9. An ink-ribbon carrier provided with turning-bars arranged diagonally to change
10 the direction of the ink-ribbon right angularly on either side of the printing-point and pawls beneath said carrier, substantially as specified.
- 10 10. An ink-ribbon carrier provided with turning-bars and with tension-bars beneath the turning-bars, substantially as specified.
11. The combination of a movable ink-ribbon carrier, a platen, and ribbon-spools, the carrier being arranged between the platen
20 and spools and provided with tension devices, substantially as specified.
12. A movable ink-ribbon carrier provided with pawls, in combination with ribbon-spools provided with ratchets operatively connected
25 with the carrier-pawls, substantially as specified.
13. The combination of a platen, a movable ink-ribbon carrier arranged adjacent to the printing-point on the platen and provided
30 with ribbon-turning bars and adjustable ribbon-tension bars, substantially as specified.
14. A movable ink-ribbon carrier, in combination with a step-by-step feed mechanism and a bar, rod, or wire arranged in the path
35 of the ribbon adjacent to its spools and operatively connected with the ribbon-feed mechanism, substantially as specified.
15. The combination of a movable ink-ribbon carrier, a ribbon, and its step-by-step feed
40 mechanism comprising pawls, and a bar arranged in the path of the ribbon and beneath the pawls, substantially as specified.
16. The combination, with the ribbon and its feed mechanism, comprising pawls having
45 cut-away portions, of a movable ribbon-carrier and a bar arranged beneath the pawls and ribbons, whereby said bar is inoperatively connected with one of the pawls for the purpose of permitting said pawl to perform the
50 feed function, substantially as specified.
17. A guide for a ribbon, provided with a pivoted tension-bar and with an adjusting-screw for regulating the tension.
18. The combination, with the key-levers
55 and universal bail of a type-writer, of a ribbon-carrier connected with the bail to the side of the pivot opposite the key-engaging portion thereof to partake of the motion of the bail produced by depressing the key-levers,
60 substantially as specified.
19. In a type-writer, an ink-ribbon carrier provided with diagonal turning-bars and means for maintaining a constant tension in the ribbon between the turning-bars, as set
65 forth.
20. A type-bar bracket having firmly secured therein bearings, one of which is thicker than the other, substantially as specified.
21. The combination, in a type-writer and with the carriage and platen thereof, of a
70 shield running across the entire length of said carriage and fastened to the risers D^{3x} , and extending to the front edge of the ribbon and at its mid-length curved to conform to the contour of the platen, with which it is nearly
75 in contact, substantially as specified.
22. In a type-writer, an ink-ribbon carrier provided with turning-bars and spring tension-bars, substantially as described.
23. In a type-writer, an ink-ribbon carrier
80 provided with oppositely-disposed diagonal turning-bars and adjustable tension-bars, as set forth.
24. In a type-writer, an ink-ribbon carrier formed with oppositely-disposed diagonal
85 turning-bars and with pivoted tension-bars, as set forth.
25. In a type-writer, an ink-ribbon carrier provided with oppositely-disposed diagonal turning-bars and tension-bars pivotally connected therewith and adjustable thereon to regulate the tension of the ribbon, as set forth.
90
26. In a type-writer, a ribbon-carrier mounted directly on the universal bail, substantially as described.
95
27. In a ribbon-carrier, standards having tables and tension-bars secured to the tables, substantially as specified.
28. In a ribbon-carrier, two standards having oppositely-disposed tables, each provided
100 with oppositely-disposed diagonal guiding-bars and tension-bars secured one to each table and constructed and arranged to yieldingly rest against the same, substantially as specified.
105
29. In a ribbon-carrier and in combination with the tables thereof, yielding tension-bars and means for regulating the pressure thereof against the table and an interposed ribbon, substantially as specified.
110
30. The combination, with the ribbon-spools and pawl-and-ratchet mechanism thereof, of an oscillating shaft having radial arms extending beneath the pawl, and a ribbon-carrier, substantially as specified.
115
31. The combination, with the ribbon-carrier and ribbon-spools, of an oscillating shaft having radial arms extending beneath the pawl of the spool-rotating mechanism and beneath the ribbon between the spools and the
120 carrier, substantially as specified.
32. The combination, with the pawl-and-ratchet mechanism, of the ribbon-spools, detents having projections formed with inclined faces, and an oscillating shaft having
125 arms adapted to bear on the detents, and means connected with said shaft for oscillating the same so as to alternately disconnect said detents from the ratchet of the ribbon-spools, substantially as specified.
130

33. In a type-writer, a ribbon-carrier connected directly to a universal bail and extended to and movable over the printing-point of the platen, substantially as specified.

5 34. The combination of a movable ink-ribbon carrier, a ribbon, and its step-by-step feed mechanism comprising gravitating pawls, and a bar arranged in the path of the ribbon

and beneath the pawls, substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses. 10

CHARLES SPIRO.

Witnesses:

JULIUS E. LEVY,
LEOPOLD STARK.